

CLAIMS

1. A by-pass tool (10) for incorporation in a drillstring (11), and which is adjustable between an inactive mode in which it allows fluid flow lengthwise of the drillstring during normal drilling operation, and an active by-pass mode when drilling is to be interrupted, said tool comprising:

an outer casing (20);

a sleeve (12) displaceable axially within the casing (20);

a valve seat (14) associated with the sleeve (12) and arranged to receive an activating ball (15), when the latter is launched from the surface and down the drillstring, said valve seat (14) being operative to displace the sleeve (12) axially and thereby initiate adjustment of the tool from the inactive mode to the active by-pass mode; and

by-pass port means (16) in the casing (20) and arranged to be closed by the sleeve (12) when the tool is in its inactive mode and to be opened to communicate with the interior of the drillstring when the tool is in its active mode, said by-pass port means (16) being arranged above the valve seat (14) so as to allow a locking ball (17) (when launched from the surface after the valve seat (14) has received the activating ball (15)) to partially block the port means (16) and thereby initiate flushing-out of any drillstring fluid debris above the valve seat (14) via the port means (16).

2. A by-pass tool according to claim 1, in which the by-pass port means comprises two by-pass ports (16), a first of which is closeable following launch of the locking ball (17), whereby drillstring debris can be flushed-out via a second of the by-pass ports (16).

3. A by-pass tool according to claim 2, in which the second by-pass port (16) is closeable, following launching of a second locking ball (18), in order to:

- (a) close the by-pass port means (16);
- (b) to initiate deformation of the activating ball (15) by upstream drillstring fluid pressure so that the ball (15) passes downwardly through the valve seat (14);
- (c) the sleeve (12) is returnable to a position corresponding to the inactive mode of the tool; and,

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(d) the locking balls (17, 18) are then displaceable out of the respective first and second by-pass ports (16) and follow the downward movement of the activating ball (15) through the valve seat (14), thereby to re-set the tool.

4. A by-pass tool according to any one of claims 1 to 3, in combination with a deformable activating ball (15) and at least one locking ball (17, 18).